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Claims

[c1] A method of generating a magnetic resonance image comprising:
subjecting a subject to a magnetic field, said subject comprised of a first tissue a second tissue and a third tissue;
generating a first inversion radiofrequency pulse;
generating a first train of radiofrequency pulses a first TI time
taking a first image after said first train of radiofrequency pulses;
generating a second inversion pulse;
generating a second train of radiofrequency pulses at a second TI time , said second TI time greater than said first TI time;
taking a second image after said second train of radiofrequency pulses; and
generating a resultant image by combining said first image and said second image.

[c2] A method as described in claim 1, wherein said first TI time is approximately coincident with a T_1 null time of the first tissue and wherein said first train of radiofre-

quency pulses constitute a data acquisition segment in a segmented K-space acquisition.

[c3] A method as described in claim 1, wherein said second TI time is approximately coincident with a T_1 null time of the third tissue.

[c4] A method as described in claim 1, wherein said first TI time is less than 100ms.

[c5] A method as described in claim 1, wherein said second TI time is between 150 and 250 ms.

[c6] A method as described in claim 1, further comprising: introducing a contrast agent prior to taking said first image.

[c7] A method as described in claim 1, wherein:
said first tissue comprises infarcted tissue;
said second tissue comprises blood;
said third tissue comprises normal myocardium tissue;
said first image nullifies said infarcted tissue;
said second image nullifies said normal myocardium tissue; and
said resultant image shows improved differentiation between said infarcted tissue and said normal myocardium tissue.

[c8] A method as described in claim 1, wherein said second inversion pulse is generated immediately after taking said first image.

[c9] A method as described in claim 1, wherein:
said first tissue comprises a first T_1 relaxation time;
said second tissue comprises a second T_1 relaxation time;
said third tissue comprises a third T_1 relaxation time;
wherein said third T_1 relaxation time is greater than said second relaxation T_1 time and said third T_1 relaxation time is greater than said first T_1 relaxation time.

[c10] A method as described in claim 9, wherein said second T_1 relaxation time is greater than said first T_1 relaxation time.

[c11] A method as described in claim 6, wherein the concentration of said contrast agent is higher in said first tissue than in either said second tissue or said third tissue.

[c12] A method as described in claim 1, wherein said combining said first image and said second image comprises subtracting said first image from said second image.

[c13] A method of generating a magnetic resonance image comprising:
subjecting a subject to a magnetic field, said subject

comprised of a first tissue a second tissue and a third tissue;

generating a first pulse sequence at a first TI time;

generating a first image after said first pulse sequence, said first image having a first image first tissue magnitude, a first image second tissue magnitude, and a first image third tissue magnitude;

generating a second pulse sequence at a second TI time;

generating a second image after said second pulse sequence, said second image having a second image first tissue magnitude, a second image second tissue magnitude, and a second image third tissue magnitude; and

generating a resultant image by combining said first image and said second image, said first image first tissue magnitude and said second image first tissue magnitude combining to form a positive resultant first tissue magnitude, said first image third tissue magnitude and said second image third tissue magnitude combining to form a negative resultant image third tissue magnitude.

[c14] A method as described in claim 13, wherein said first image second tissue magnitude and said second image second tissue magnitude combine such that said resultant image second tissue magnitude is less than said second image second tissue magnitude.

[c15] A method as described in claim 13, wherein:
said first TI time is approximately coincident with a T_1 null time of said first tissue; and
said second TI time is approximately coincident with a T_1 null time of said third tissue.

[c16] A method as described in claim 13, wherein:
said first tissue comprises infarcted tissue;
said second tissue comprises blood; and
said third tissue comprises normal myocardium tissue.

[c17] A method as described in claim 13, further comprising:
introducing a contrast agent into said subject prior to generating said first image.

[c18] A magnetic resonance imaging assembly for imaging a subject comprised of a first tissue, a second tissue, and a third tissue, the magnetic resonance imaging assembly comprising:
a controller comprising logic adapted to:
generate a first inversion pulse;
generate a first train of gradient-recalled echo radiofrequency pulses at a first TI time;
generate a first image after said first train of gradient-recalled echo radiofrequency pulses;
generate a second inversion pulse;
generate a second train of gradient-recalled echo ra-

diofrequency pulses at a second TI time, said second TI time greater than said first TI time;
generate a second image after said second train of gradient-recalled echo radiofrequency pulses; and
generate a resultant image by digitally combining said first image and said second image.

[c19] A magnetic resonance imaging assembly as described in claim 18, wherein:
said first TI time is approximately coincident with a T_1 null time of the first tissue; and
said second TI time is approximately coincident with a T_1 null time of the third tissue.

[c20] A magnetic resonance imaging assembly as described in claim 18, wherein said logic is further adapted to:
generate said resultant image by subtracting said first image from said second image.

[c21] A magnetic resonance imaging assembly as described in claim 18 wherein the said logic comprises an image acquisition segment segmented in k-space and ECG-gated to freeze cardiac motion.

[c22] A magnetic resonance imaging assembly as described in claim 18 wherein the said logic comprises an image acquisition segment comprising a train of gradient-re-

called echo rf pulses.

[c23] A magnetic resonance imaging assembly as described in claim 18 wherein the said logic comprises an image acquisition segment comprising either gradient recalled echoes or steady-state free-precession sequences.